instruction manual

KV2-100, KV2-150, KV2-200

~~KV 100-3~~

SZ

KV2-100
KV2-150

Beta Electric

Sorensen

Sorensen & Company, inc.
Richards Avenue
South Norwalk, Conn.

PLEASE RETURN TO LIBRARIAN
ORG. 6-7744 M.S. 27-14
manual #1

KV2-100, KV2-150, KV2-200

MODEL NO. ~~KV-100-3~~

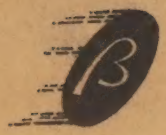
SERIAL NO. 5Z

KV2-100
KV2-150
KV2-200

NOTE:

Please read the entire instruction manual thoroughly before attempting to operate the unit.

If this is not convenient, please read the operating instructions completely before applying power for the first time.



BETA ELECTRIC CORP.,

NEW YORK 29, N. Y.

INSTRUCTION MANUAL

FOR

MODELS 111, 112 AND 113

NOW KNOWN AS

KV2-100; KV2-150; KV2-200

AND

MODELS 111A, 112A AND 113A

NOW KNOWN AS

KV-100; KV-150; KV-200

KILOVOLTMETERS

September, 1955

Beta Electric Corp.
New York 29, N.Y.

The Series KV Kilovoltmeters are identical to the Series 111 KILOVOLTMETERS, with the exception of change of nomenclature.

OLD NOMENCLATURE	NEW NOMENCLATURE
111	KV2-100
112	KV2-150
113	KV2-200
111A	KV-100
112A	KV-150
113A	KV-200

UNCRATING & KILOVOLTMETER SETUP INSTRUCTIONS

KINDLY READ CAREFULLY BEFORE UNWRAPPING:

1: Open the package carefully. Rough handling may mar the finish of the meter multiplier cylinder, or crack the lucite cylinder.

2: Remove the multiplier cylinder from the carton, and place in position near the power supply whose voltage is to be measured.

3:* Unwrap the anti-corona connector and the lucite dust cover.

4:* Place the lucite dust cover on top of the cylinder.

5:* Screw the anti-corona connector into place, until it holds the dust cover tightly.

It is suggested that the anti-corona connector be polished after handling.

*NOTE:
On some units the anti-corona knob and lucite cover are shipped in place, so steps 3, 4 and 5 may be unnecessary.

SECTION I - SPECIFICATIONS

A: ELECTRICAL:

(a) Range:

Model 111: 0-100 kilovolts dc.
Model 112: 0-150 kilovolts dc.
Model 113: 0-200 kilovolts dc.

(b) Indication:

AVERAGE voltage indicated.

(c) Sensitivity:

Model 111: Approximately 20,000 ohms per volt.
Model 112: Approximately 10,000 ohms per volt.
Model 113: Approximately 10,000 ohms per volt.

(d) Peak voltage:

The multiplier can be subjected to peak voltages as great as:

150 kilovolts (Model 111)
175 kilovolts (Model 112)
250 kilovolts (Model 113)

for 10 milliseconds, without damage.

(e) Meter:

4" square bakelite case.

(f) Accuracy:

The overall kilovoltmeter precision is 4% of full scale, or better, over the entire range.

(g) Controls:

Selector switch, "+", "-", or TRANSIT.

(h) Safety features:

1: Gaseous discharge device across meter to protect against overvoltages.
2: Spark gap to ground from metering circuit to protect against flashovers.
3: Shield around multiplier for leakage current "guard" circuit, and flashover bypass to ground.

(i) Protective feature:

1: "Transit" switch for shorting meter movement when unit is being moved.

B: MECHANICAL:

(a) Multiplier size:

Model 111: 6-5/8" diameter, x 21-3/4" high; 24-1/2" to top of anti-corona knob. Stabilizing base: 1 foot square.

Model 112: 6-5/8" diameter x 26-3/4" high; 31-1/2" to top of anti-corona knob. Stabilizing base: 1 foot square.

Model 113: 6-5/8" diameter x 35" high; 37" to top of anti-corona knob. Stabilizing base: 1-1/2 foot square.

(b) Multiplier weight: Model 111: Approximately 30 pounds.
Model 112: Approximately 60 pounds.
Model 113: Approximately 90 pounds.

* * * *

SECTION II - OPERATING INSTRUCTIONS

1: Tie the binding post labelled ALWAYS OPERATE WITH GOOD EXTERNAL GROUND on the meter cabinet, and the binding post labelled ALWAYS OPERATE WITH GOOD EXTERNAL GROUND on the multiplier cabinet to ground. It is suggested that these ground points be tied together for maximum safety.

2: Connect the binding post labelled TO METER CABINET on the multiplier cabinet to the binding post labelled FROM MULTIPLIER on the meter cabinet.

The meter cabinet can be located almost any convenient distance away from the multiplier box, as required. Since the meter movement itself is a low impedance meter, the instrument can be located up to several hundred feet away from the multiplier cylinder without encountering stray voltage pick up problems.

3: Connect the source of high voltage under measurement to the anti-corona connector by the largest diameter possible, smooth, pipe. (This is required to minimize corona.)

4: If the high voltage is negative with respect to ground, the selector switch should be at the (-) position. If the high voltage is positive with respect to ground, the selector switch should be at the (+) position.

5: Whenever the meter is being moved, the selector switch should be in the TRANSIT position.

OPERATING INSTRUCTIONS FOR MODELS 111-A, 112-A and 113-A:

The meter cabinet can be located almost any convenient distance away from the multiplier box, as required. Since the meter movement itself is a low impedance meter, the instrument can be located up to several hundred feet away from the multiplier cylinder without encountering any stray voltage pickup problems.

1: Mount the indicating meter in a NON-MAGNETIC panel, with the calibrating resistor R4 directly across the terminals, as per drawing β-a-111,112,113-1.

2: Wire the meter either corresponding to fixed output polarity, or to a polarity reversing switch, per drawing, β-a-111, 112, 113-A-1. (The transit position is not necessary.)

Wire capacitor C1, spark gap E2, neon pilot light I1, and resistors R2 and R3 as shown in drawing β-a-111,112,113A-1 to protect M1.

3: Tie the binding post J2 of the multiplier to ground.

4: Run a wire from J3 of the multiplier to the "high" end of R2 wired up in step (2) above.

5: Connect the source of high voltage under measurement to the anti-corona connector by the largest diameter possible, smooth, pipe. (This is required to minimize corona.)

MODEL WAS FORMERLY 111,112,1131	HJ	12/55
ADDED W1, P3, AND P4	FR	4-15-57
REVISED DRAWING OF METALLIC SHIELD.	HC	5-28-58

KV DC METER MODEL KV2 SERIES
SCHEMATIC CIRCUIT DIAGRAM

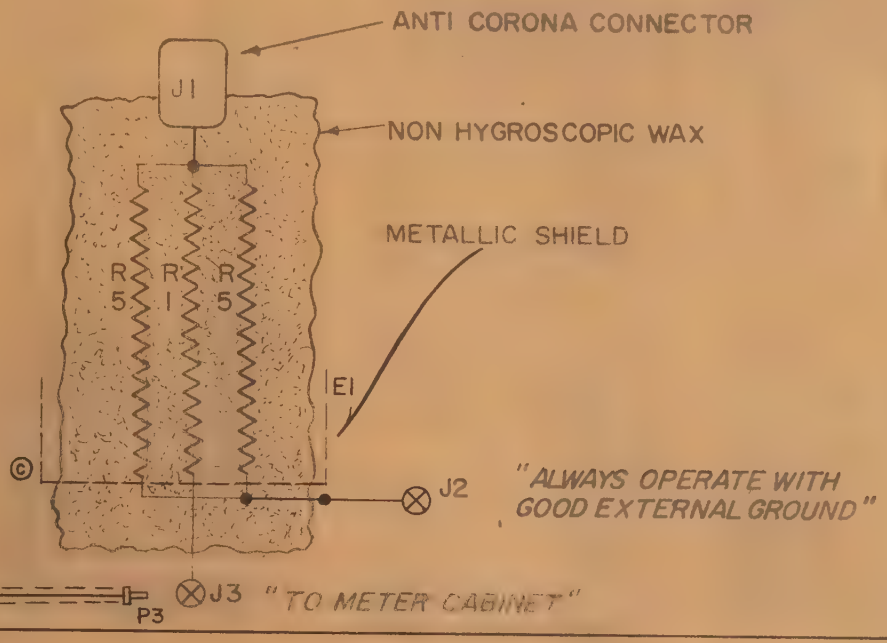
DRAWN BY HJ 10/13/55

CHECKED BY 11/11/55 RdC 1/5/56

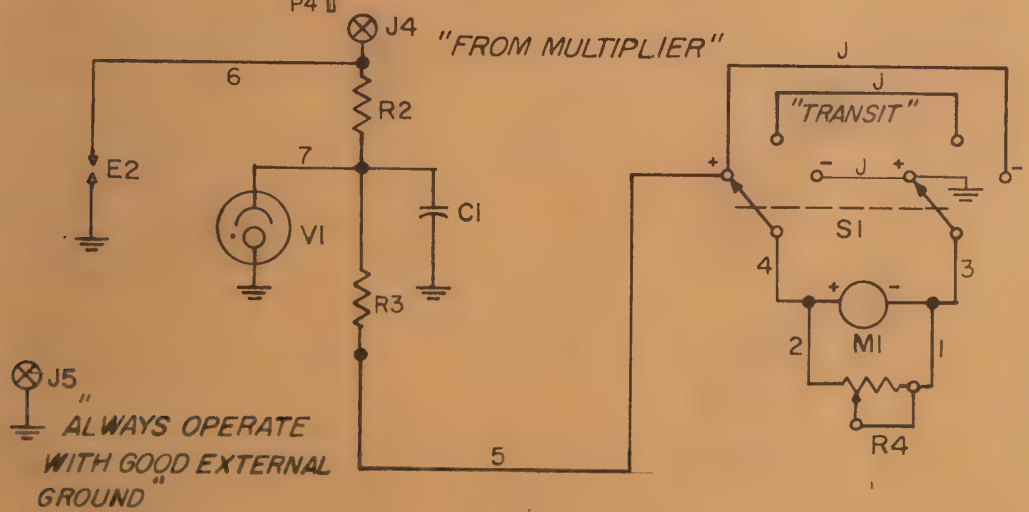
KV2-1

CONNECTIONS OF HIGH VOLTAGE MULTIPLIER

TIPLIER CYLINDER



ER CABINET



REVISION	BY	DATE

PARTS PLACEMENT
(METER CABINET)

DIMENSIONS IN INCHES
DO NOT SCALE

DRAWN BY HJ 1/9/56

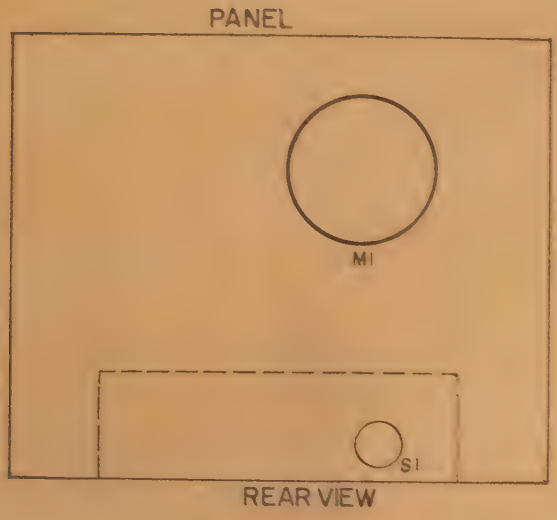
CHECKED BY

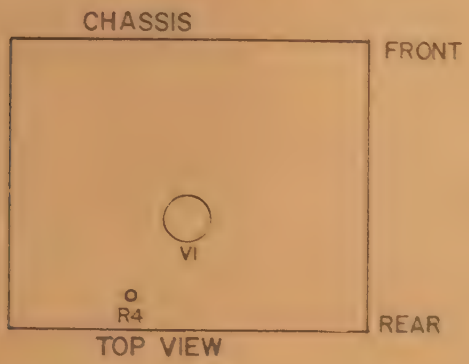
APPROV BY

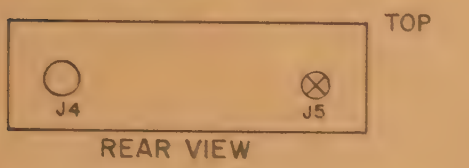
BETA ELECTRIC CORP
NEW YORK 29 N Y

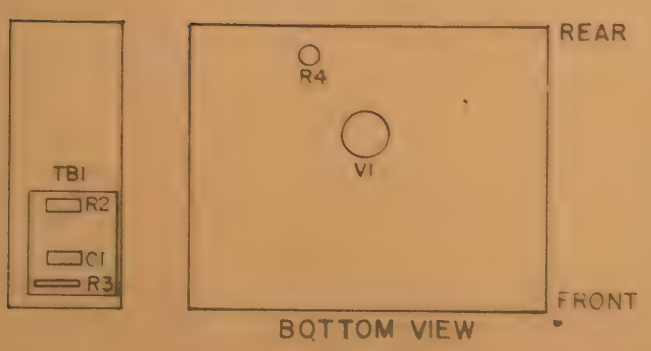
KV2-2

D









REVISION	BY	DATE

Series KV and KV2 Kilovoltmeters

DATE 12/27/56

TYPED BY: hk

CHECKED BY hk 12/28/56

APP'D BY

BETA ELECTRIC CORP.

PARTS LIST. PAGE 1

PART NO.	BETA CODE NO. AND DESCRIPTION	LOCATION	FUNCTION
A1*	Black vinyl tubing; 6" ID, 6-9/16" OD; drilled per dwg. β-b-A1-KV2.		Houses multiplier.
A2*	Blask bakelite disc per dwg. β-b-A1-KV2. 6-7/8"D x 3/8"D.		Cap for multiplier.
A3*	Black bakelite plate per dwg, β-b-A3-KV2, 12 x 12 x 3/8".		Multiplier stabilizing base.
A4**	Sloping front cabinet; β-c-3A-10109S ***		Houses meter, switching, protective and calibrating circuits.
A5**	Chassis punched per β-d-11A-10109SP-KV2 (blank)		
A6	Panel punched per β-c-22A-10109SP-KV2 (blank)		
C1*	0.05 µfd, 400V paper; Sangamo type 35 or equiv.		Surge suppressor.
E1	Copper mesh shield, 6" high		Leakage current guard.
E2	10mm automobile std. sparkplug.		Flashover protector.
H1*	Multiplier housing base clamp; per dwg. β-b-A3-KV2.		Braces A1 against A3.
H2**	Knob; 1-1/4" pointed black bakelite knob; 1/4" shaft, brass insert; ICA #1274S or equivalent.		
H3 (45H)	Resistor bracket, 2"; Mallory VR8.		Holds multiplier to base.
H4	78H Leather carrying handle; Philadelphia Model 800, 4-1/2".		Carrying handle.
H5	74H Miller #MB50, 1/2"D rubber foot, 6/32 x 1/4" stud.		Rubber feet.
H6,7	54H Resistor mtg brackets, Ohmite.		
J1	HV connector set; β-a-111-HVC-3.		For connection to test point.
J2	105J ICA type 631 binding post.		For connections as labelled.
J3	54J Coaxial receptacle, AN SO-239J	Mult.	For connections as labelled.
J4**	54J Coaxial receptacle, AN SO-239J		For connections as labelled.

* - Item on which specifications have recently changes. On Serial #'s 1-29, there may be obvious differences.

** - Item not provided with KV design.

REVISION	BY	DATE

Series KV and KV2 Kilovoltmeters

DATE 12/27/56

TYPED BY: hk

CHECKED BY

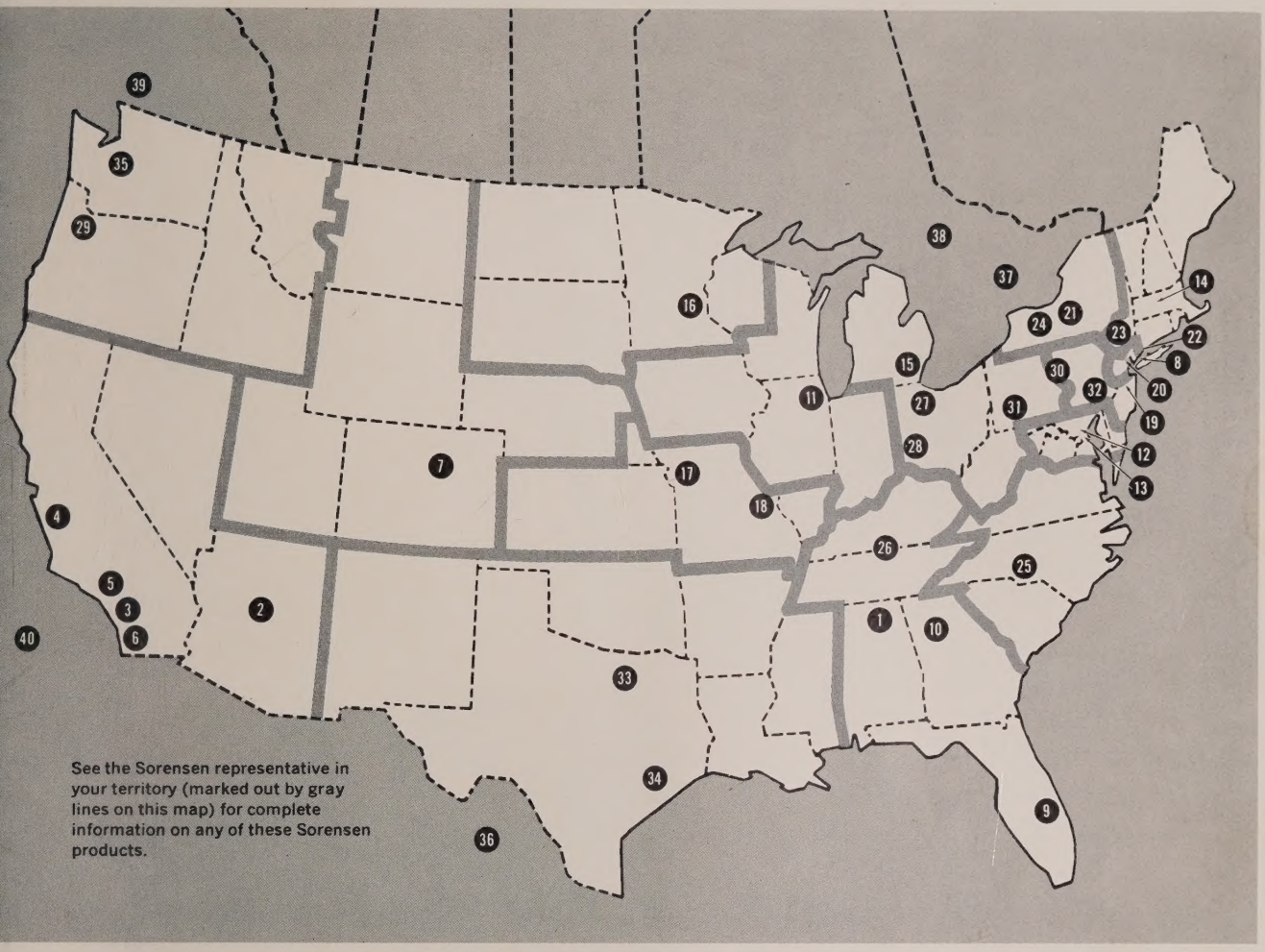
APP'D BY

BETA ELECTRIC CORP.

PARTS LIST. PAGE 2

PART NO.	BETA CODE NO. AND DESCRIPTION	LOCATION	FUNCTION
J5**	105J Per J2		For connections as labelled.
P3,4	54P Amphenol plug AN PL-259.		Mate with J3,4.
M1	DC microammeter, 50 microamperes full scale; 4" square bakelite case; Simpson Model 29; dial labelled: Model KV-100: : 0-100 KV DC KV-150: : 0-150 KV DC KV-200: : 0-200 KV DC		Indicates output voltage.
R1*	Model KV-100: : 1,800M, 10%, RPC--DZZ KV-150: : 2,520M, 10%; 4 resistors in series, 3 at 675M, 10%; 1 at 500M; all RPC type BFW. KV-200: : 3,375M, 10%; 5 resistors in series 675M, 10% tolerance; RPC type BFW.		Kilovoltmeter multiplier.
R2	1.25 M, 15% tolerance; RPC - BBM		Flashover surge protector.
R3	0.5M, 15% tolerance, 1W, carbon.		Overvoltage protector.
R4*	50k wire wound pot, 2W, screwdriver shaft with locking nut; minimum resistance approx: 1K.		Calibrating resistor.
R5*	Model KV-150: : 13,500M, 15%; RPC type DZZ, 10000M in series with DZW, 3,500M. Model KV-200: : 17,000M, 15% tolerance; RPC type DZZ, 10,000 M in series with 2-DZW, 3,500M.		Shielding resistor.
S1**	Centralab #1473		Selects as labelled.
TB1	7TB 5 position; Prec. 2602.		Mounts components.
V1*	Type VR75 voltage regulator.		Overvoltage protector.
XV1	Tube socket, octal, bakelite insulation; Amphenol #77-MIP-8 or equivalent.		Holds respective tube.
W1	2W RG 8/U cable, 20 ft.		Interconnecting cable.

*, ** - See page 1


See the Sorensen representative in your territory (marked out by gray lines on this map) for complete information on any of these Sorensen products.

1 ALABAMA — Huntsville *
Bivins & Caldwell, Inc.
JEfferson 2-5733

2 ARIZONA — Phoenix *
McCarthy Associates
111 Osborn West, Suite 213
CRestwood 9-1891

3 CALIFORNIA — Hollywood
Sorensen's West Coast Warehouse
Bekins Warehousing Corp.
1025 No. Highland Ave.

4 CALIFORNIA — Menlo Park *
McCarthy Associates
635 Oak Grove Avenue
DAvenport 6-7937

5 CALIFORNIA — Pasadena *
McCarthy Associates
1055 E. Walnut
SYcamore 2-8272

6 CALIFORNIA — San Diego *
McCarthy Associates
934 W. Laurel Street
BElmont 9-4015

7 COLORADO — Denver 10 *
Lahana & Company
1886 South Broadway
PEarl 3-3791

8 CONNECTICUT — Bridgeport *
Yewell Associates, Inc.
1101 East Main Street
FOrest 6-3456

9 FLORIDA — Orlando *
Bivins & Caldwell, Inc.
P. O. Box 6025
1226 E. Colonial Dr.
CHerry 1-1091

10 GEORGIA — Atlanta 5 *
Bivins & Caldwell, Inc.
3133 Maple Drive, N. E.
CEdar 3-7522

11 ILLINOIS — Chicago 45 *
Pivan Engineering Co.
2820 Peterson Avenue
BRiargate 4-9135

26 KENTUCKY
Bivins & Caldwell, Inc.*
1923 N. Main Street
High Point, North Carolina
High Point 2-6873

12 MARYLAND — Baltimore 15 *
Horman Associates, Inc.
3006 W. Cold Spring Lane
MOhawk 4-8345

13 MARYLAND — Rockville *
Horman Associates, Inc.
941 Rollins Avenue
HAzelwood 7-7560

14 MASSACHUSETTS — Burlington *
Yewell Associates, Inc.
Middlesex Turnpike
BRowning 2-9000

15 MICHIGAN — Detroit 35 *
S. Sterling Co.
15310 W. McNichols Rd.
BRoadway 3-2900

16 MINNESOTA — Minneapolis 3 *
Pinkney & Hine Company
1925 Nicollet Avenue
FEderal 8-0523

17 MISSOURI — Kansas City 30
Harris-Hanson Co.
7916 Paseo Avenue
HIghland 4-9494

18 MISSOURI — St. Louis 17
Harris-Hanson Co.
2814 S. Brentwood Blvd.
MIssion 7-4350

19 NEW JERSEY — Asbury Park *
The I. E. Robinson Co.
905 Main Street
KEllogg 1-3150

20 NEW JERSEY — Englewood *
RMC Associates, Inc.
391 Grand Avenue
LOwell 7-3933

21 NEW YORK — Dewitt*
J. D. Ryerson Associates, Inc.
111 Kinne Road
Syracuse—GIbson 6-1771
Mail: P. O. Box 1400,
Syracuse, N. Y.

22 NEW YORK — New York*
RMC Associates, Inc.
236 E. 75th Street
TRafalgar 9-2023

23 NEW YORK — Poughkeepsie *
Yewell Associates, Inc.
806 Main Street

24 NEW YORK — Rochester 18 *
J. D. Ryerson Associates, Inc.
105 Pickwick Drive

25 NORTH CAROLINA — Charlotte 5
James L. Highsmith Co.
3733 Monroe Rd.
FRanklin 7-2546

27 OHIO — Cleveland 24 *
S. Sterling Co.
5827 Mayfield Rd.
HIllcrest 2-8080

28 OHIO — Dayton 2 *
S. Sterling Co.
379 West First Street
FUlton 8794

29 OREGON — Portland 9 *
ARVA
1238 N. W. Glisan Street
CApital 2-7337

30 PENNSYLVANIA — Camp Hill *
The I. E. Robinson Co.
2120 Market Street
REgent 7-6791

31 PENNSYLVANIA — Pittsburgh 27 *
S. Sterling Co.
4024 Clairton Blvd.
TUxedo 4-5515

32 PENNSYLVANIA — Upper Darby *
The I. E. Robinson Co.
7404 West Chester Pike
FLanders 2-7017

26 TENNESSEE
Bivins & Caldwell, Inc.*
1923 N. Main Street
High Point, North Carolina
High Point 2-6873

33 TEXAS — Dallas 9*
Earl Lipscomb Associates
P. O. Box 7084
FLeetwood 7-1881

34 TEXAS — Houston 5 *
Earl Lipscomb Associates
P. O. Box 6646
3825 Richmond Avenue
MOhawk 7-2407

35 WASHINGTON — Seattle 9*
ARVA, Inc.
1320 Prospect Street
MAin 2-0177

36 MEXICO
ELECTRO LABS., S.A.*
Guanajuato #115
Mexico City, Mexico
Tels: 11-60-94, 11-70-58

CANADA

37 BAYLY ENGINEERING, LTD.*
Hunt Street
Ajax, Ontario, Canada
Toronto: EMpire 2-3741

38 BAYLY ENGINEERING, LTD.*
48 Sparks Street
Ottawa, Ontario, Canada
CEntral 2-9821

39 BRITISH COLUMBIA
ARVA *
355 Burrard St.—Room G7
Vancouver 1, B. C.
MUtual 1-3367

40 HAWAII
GENE PIETY FACTORS, INC.
2030 Home Rule Street
Honolulu 17, Hawaii
Phone 83105

**These representatives have service facilities.*

Sorensen

SORENSEN & COMPANY, INC.

Richards Avenue, South Norwalk, Connecticut

WIDEST LINE OF CONTROLLED-POWER
EQUIPMENT FOR RESEARCH AND INDUSTRY